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# MANAGEMENT FOR DISTAL RADIUS FRACTURES IN ADULT: CLINICAL AUDIT

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**Abstract**

***Background:***
*Proper management of distal radius fracture (DRF) in adults is necessary to avoid impaired hand and wrist function.*

***Aim:***
*This audit makes a distinction between clinical practice and guidelines which will lead to the development of approaches to improve the quality of day-to-day care with*

***Method:***
*This audit proposal is proposed by an Orthopedic surgeon. The data will be collected in a single center. The data required for this audit is radiological evidence resulting in radial shortening, dorsal tilt, comminution, and radial tilt. Clinical audit is a continuous part of the process of quality andimprovement which focuses on clinical practice and improving the care provided to the patient. Audit standards are acquired from the Fractures (non-complex): assessment and management NICE guideline [NG38] against the standard practice. The recommended step to meet the standard: Firstly, close reduction and plaster cast is done. Secondly, if there is any obvious deformity of the wrist the patient is taken up for open reduction and internal fixation. The foremostis the timing for surgery for intra-articular fracture, within 72hours of trauma the patient should be advised for surgery, and extra-articular fixation for the fracture is likely to be done within 7 days of injury.*

***Conclusion:***
*This clinical audit of Distal Radius Fracture gives the orthopedic surgeons insight into the definitive treatment for extra-articular fractures and the timing for surgery in both intra-articular and extra-articular fractures of the wrist.*

## INTRODUCTION

The most frequent wrist injury orthopedic surgeons treat is distal radius fractures (DISTAL RADIUS FRACTUREs) (MacIntyre & Dewan, 2016; Meena, Sharma, Sambharia, &Dawar, 2014). Fractures of the distal radius depending on the nature of the damage, such as Smith, Barton, and Colles fractures (MacIntyre&Dewan, 2016).

Typically, these fractures are seen as closed, displaced fractures that can occur intra- or extra-articularly (Handoll&Madhok, 2003). Young adult patients are more likely to experience intra-articular displacement in distal radius fractures, which is mostly brought on by high-energy trauma.

However, the elderly age group experiences extra-articular fractures (Meena et al., 2014). Globally, the prevalence of DISTAL RADIUS FRACTURE is progressively rising (MacIntyre&Dewan, 2016). Still, the emergency department (ER) sees a large portion of adult (skeletally mature) wrist fractures—roughly one-

sixth of all cases—(Mathews & Chung, 2015). The management of DISTAL RADIUS FRACTURE is critical because of common issues including carpal tunnel syndrome, extensor tendon ruptures, flexor and extensor tendon irritation, and neurological consequences from ulnar, median, and radial nerve injuries (Arora et al., 2011). Conservative and surgical methods are available for DISTAL RADIUS FRACTURE treatment (Mathews & Chung, 2015).

The following are some methods for managing DISTAL RADIUS FRACTURE: external fixation, open reduction and internal fixation, closed reduction and casting, and closed reduction and percutaneous pinning (Mathews & Chung, 2015). The justification for the DISTAL RADIUS FRACTURE audit is that delayed or inadequate patient care might result in consequences such as malunion, non-union of the fracture, and subsequent neurological issues (Seigerman et al., 2019).

This clinical audit seeks to examine clinical practice by recognized guidelines. And to impose the introduction of definitive treatment for extra-articular DISTAL RADIUS FRACTURE fractures, the timing for surgery in both intra and extra-articular wrist fractures.The goals of this audit are to ensure the definitive treatment of DISTAL RADIUS FRACTURE in adults (skeletally mature). Furthermore, surgery for a distal radius fracture must be performed appropriately.

**METHODS:**

In a private trauma and orthopedic hospital in India, an orthopedic surgeon has proposed this audit. Data will be gathered prospectively for this clinical audit.

From October 2023 to June 2024, a total of 100 orthopedic ward patients will be evaluated.

The patient's case sheet or report will contain the data required for this audit, and the primary source of information to be gathered from the radiological department is the radiological findings. A senior orthopedic department consultant will evaluate and process these results, and all reports will be added to the database (MICROSOFT EXCEL®) by the orthopedic surgeon.

The following conditions had to be met for inclusion: (1) age range of 18–65; (2) trauma lasting less than 14 days; (3) radiological diagnosis of DISTAL RADIUS FRACTURE; and (4) recent distal radius fractures (Xie et al., 2018).

The subsequent patients were approved (1) injuries lasting more than three weeks; (2) pathological fractures; (3) open fractures; and (4) presenting with polytrauma or numerous fractures (Y. Li, Zhou, Zhang, Tian, & Zhang, 2019; Xie et al., 2018)

**AUDIT CRITERIA:**

First off, casting and manipulation will lower the chance of neurological symptoms in all patients with distal radius fractures. According to Leon et al. (2004), this criterion assumes that the conventional procedure for treating distal radius fractures is closed reduction followed by cast immobilization. Flexion increases should be used to treat patients with stable distal radius fractures so they can mobilize as soon as possible, up till pain is relieved (Ikpeze, Smith, Lee, &Elfar, 2016).

There are several bracing designs and processes for immobilization; randomized studies comparing above-elbow casting to below-elbow casting have been conducted (Leone et al., 2004). However, immobilization via below-elbow casting produces a better result, according to Leone et al. (Leone et al., 2004). Nonetheless, early treatment and the use of a plaster cast can lessen the chance of developing problems including hematoma/swellings and involvement of the median, radial, and ulnar nerves, which can arise from a fracture (Seigerman et al., 2019).

Second, if closed reduction is not feasible, the orthopedic surgeon should treat the fractured distal end of the radius with an open reduction and internal fixation. According to this criterion, in cases where surgery is necessary, the patient is best served by prompt action from a surgeon who is qualified enough, as waiting would not improve the patient's prognosis (Pandit&Pandit, 2009). Furthermore, the patient needs to be fully

informed about all available management options and actively participate in the decision-making process regarding the procedure.

Additionally, the patient's written and verbal agreement should be obtained before the procedure by the surgeon, who should also discuss the potential risks and problems (Vahdat, Hamzehgardeshi, Hessam, &Hamzehgardeshi, 2014). While open reduction and internal fixation is the preferred course of treatment for patients with nerve and vascular injuries, open wounds, and visible deformities, closed reduction is still seen to be an effective treatment for DISTAL RADIUS FRACTURE (S. Li et al., 2010).

Finally, for intra-articular fractures, all patients should receive treatment within 72 hours of the event and for an extra-articular fracture, within a week. The purpose of choosing this particular criterion is to highlight the importance of surgery scheduling (Iorio, Harper, &Rozental, 2018).

Delays in surgery can have detrimental effects on hematoma formation and subsequent healing, in addition to increasing pain. However, if re-displacement following manipulation requires surgery, the treatment must be completed within 72 hours of the decision to operate. According to Vahdat et al. (2014), the patient must actively participate in the choice to undergo surgery and be aware of any associated risks. On the other hand, the precise timing of DISTAL RADIUS FRACTURE surgery yields better results (Meena et al., 2014).

**STANDARDS AND EXCEPTION:**

Guidelines for fractures (non-complex): assessment and management from the National Institute for Health and Care Excellence (NICE) serve as a source of standards. NICE recommendation [NG38] (Table 1) (2016) National Clinical Guideline. According to (Chidgey, Leng, & Lacey, 2007), NICE guidance can assist physicians in enhancing their clinical practices by guaranteeing that the care they provide is grounded in the best available evidence; efficiently allocating resources and efforts to areas that yield the greatest improvements in patient outcomes; ensuring that clinicians adhere to regulatory requirements and consult NICE guidance when using their clinical judgment; and providing current reviews of new evidence.

According to the National Clinical Guideline, 2016 (table 1), the percentage of each standard criterion from the NICE guideline is precisely 100%. Generally, individuals (skeletally mature) with dorsally displaced distal radius fractures should consider casting and manipulation for their patients with DISTAL RADIUS FRACTURE. This standard's percentage is 100%. Patients who appear with gangrene, active bleeding, nerve damage, or arm deformity are not candidates for the insertion of a plaster cast. Such patients are not advised for this usual practice (Moffett & Moore, 2011).

Furthermore, in cases where closed reduction is not an option for extra-articular fractures, take into account open reduction and internal fixation. (Sinnott, Hamade, Pinsky, &Vasilakis, 2019) suggests that if close reduction is not possible, OPEN REDUCTION AND INTERNAL FIXATION can be used to treat extra-articular fractures and can produce noteworthy outcomes. With one exception: Patients with comorbid disorders make them unfit for surgery (Eyelade, Sanusi, Adigun, &Adejumo, 2016).

Some of the comorbid patients in this audit have experienced clinical mild to moderate adverse effects, such as tachycardia, hypertension, and hypotension. Other concomitant diseases include diabetes mellitus and anemia of chronic illness (Eyelade et al., 2016). Patients who have these ailments are therefore not candidates for surgery.

In conclusion, 100% is the standard percentage for this criterion and should operate on the distal radius within seven days or 72 hours after the accident for intra-articular fractures and extra-articular fractures. Patients with polytrauma or multiple fractures are an exception.

In summary, patients who present with significant damage to the abdomen, thorax, or head and neck require thorough evaluation, and orthopedic injuries must be treated with caution. Nonetheless, these individuals need to be closely watched over and given the right resuscitation. (O'Brien, 2003). Furthermore, it is advisable to stabilize the patient to lower rates of morbidity and death (O'Brien, 2003).

**Table 1:** A table shows us the audit criteria; percentage of the standard; Standards criteria and Exceptions obtained from Fractures (non-complex): assessment and management NICE guideline [NG38] (National Clinical Guideline, 2016).

| Audit criteria | The Percentage of the standard | Standards | Exception | Reference |
|---|---|---|---|---|
| 1. Manipulation and plaster casting for distal radius fractures can decrease the likelihood of developing neurological symptoms in patients. | 100% | In adults (skeletally mature) with dorsally displaced distal radius fractures, manipulation and application of a plaster cast should be considered. | Patients unsuitable for cast application | Fractures (non-complex): assessment and management NICE guideline [NG38], 1.4.5, (National Clinical Guideline, 2016) |
| 2. If closed reduction is not achievable, a fracture at the distal end of the radius may necessitate an open reduction and internal fixation performed by an orthopedic surgeon. | 100% | If closed reduction is not feasible for extra-articular fractures, open reduction and internal fixation should be considered. | Patients ineligible for surgery | Fractures (non-complex): assessment and management NICE guideline [NG38]1.4.6 (National Clinical Guideline, 2016) |
| 3. Patients with intra-articular fractures should receive treatment within 72 hours of injury, while those with extra-articular fractures should be treated within a week. | 100% | Surgery for intra-articular fractures of the distal radius should be conducted within 72 hours of the injury, while surgery for extra-articular fractures should be performed within 7 days of the injury. | Individuals with multiple fractures or polytrauma | Fractures (non-complex): assessment and management [NG38], 1.4.3 (National Clinical Guideline, 2016) |

**DISCUSSION:**

An efficient treatment plan for people with distal radius fractures (DISTAL RADIUS FRACTUREs) who are skeletally mature is provided by this audit (Kimber& Grimmer-Somers, 2008). Additionally, this clinical audit will help orthopedic surgeons enhance the overall great care they deliver to DISTAL RADIUS FRACTURE patients (Stewart, Bray, & Buckingham, 2016). Additionally, to enhance ER standard practice (Jarvis, 2016).

But if the ER does not adhere to the usual criteria. The percentage of the standard will then start to decrease. The percentage of the standard will be lowered, for example, if all DISTAL RADIUS FRACTURE patients are not advised to have close reduction and manipulation plaster casts due to any congenital wrist anomalies, such as Madelung's deformity (Coffey, Scheker, &Thirkannad, 2009); or if the plaster cast application

technique is done incorrectly (Iqbal, Cattell, &Dhillon, 2012).

Additionally, according to (Seigerman et al., 2019), if the orthopedic surgeon delays making a surgical decision, if the patient presents with multiple fractures or polytrauma, or if the patient is not fit for surgery, delaying the timing of surgery and definitive treatment for DISTAL RADIUS FRACTURE will affect the standardization rate.

Alternatively, to raise the standard's percentage orthopedic doctors are advised by this clinical audit to exercise caution when determining the exact timing of injury and the best course of action for treating DISTAL RADIUS FRACTURE. However, in DISTAL RADIUS FRACTURE, the time of injury should be taken into account because surgical fixation of DISTAL RADIUS FRACTURE requires care within 72 hours of damage for intra-articular fractures and 7 days of injury for extra-articular fractures (table 1) (Qiu et al., 2015).

Additionally, people with skeletal maturity should follow a defined treatment plan for DISTAL RADIUS FRACTURE, and all patients with DISTAL RADIUS FRACTURE who visit the emergency room should get conservative management. Comply with the standard protocol for immobilization using a plaster cast. When conservative measures prove ineffective, patients with extra-articular fractures are sent for surgical fixation, such as open reduction and internal fixation, if close reduction is not feasible.

**CASE 1:**


***Image 1.1:*** *X-ray shows left distal radius intra-articular fracture in AP and Lateral view*

***Image 2.1****: Post op x-ray of OPEN REDUCTION AND INTERNAL FIXATION with plating and k-wire fixation in AP and Lateral view*

***CASE 2:***


***Image 1.2:*** *X-ray shows left distal radius intrarticular fracture in AP and lateral view*

***Image 2.2:*** *Post reduction X-ray in AP and lateral view*

***CASE 3:***


***Image 1.3:*** *X-ray shows distal extrarticular radius fracture of right hand AP and Lateral view*


***Image2.3:*** *Post op xray with OPEN REDUCTION AND INTERNAL FIXATION with plating AP and Lateral view*

## CONCLUSION

We can gain the most valuable information into the standard of healthcare and effective treatment for distal radius fractures (DISTAL RADIUS FRACTURE) from this audit. When it comes to adult (skeletally mature) DISTAL RADIUS FRACTURE fractures, proper care can result in a favorable outcome despite all potential problems. If closed reduction is not feasible for extra-articular fractures, open reduction and internal fixation are carried out. For extra-articular fractures, consider manipulation and a plaster cast. Orthopedic surgeons need to know when the patient should report an injury. In the event that DISTAL RADIUS FRACTURE requires surgery. When treating an intra-articular fracture of the closed radius, for example, surgery should be performed within 72 hours after the injury, and for extra-articular fractures of the wrist, it should be done within 7 days. On the other hand, this adoption ought to improve the standard of treatment provided to DISTAL RADIUS FRACTURE patients.

## AUTHOR CONTRIBUTIONS

The authors DrAshin Khan and Dr Abraham. M. Anthonycontributed equally for its content, writing and editing of manuscript. The manuscript was reviewed and by DrMadhukar before submission.

## CONFLICTS OF INTEREST

The authors declare no conflict of interest

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